of carbon were poured into the five fasciculi; the box was tightly closed, and the whole left for a month (January 15th to February 15th). All the insects were destroyed and no injury was done to the specimens or to the papers on which they were fastened. A little later in the season a fortnight was found to be sufficient. The expense of the operation is very small; and M. Schnetzler recommends that the boxes should be placed under a shed, as in case of the escape of any vapour from them there might be danger of explosion. The same process may be employed for collections of insects.—*Comptes Rendus*, April 10, 1876, p. 863.

Silica of Grasses and other Plants carried up as Diatoms or other Siliceous Grains, and not in Solution or as Soluble Silicates. By Prof. P. B. Wilson.

My attention was called, some time since, in the examination of the ash of plants obtained by slow incineration in a platinum crucible, to the fact that when the ash is treated with dilute acid, and evaporated to dryness on the water-bath, it does not pass into the gelatinous condition prior to complete decomposition of the *hydrated* mass, as is the case with the silicates soluble in acid, or those decomposed with sodium and potassium carbonates. If, however, the ash, prior to the treatment with acid, is subjected to a high temperature, a combination of silicic acid with the alkalies, the alkaline earths, and the earths takes place, if all are present; then the silica separates in the gelatinous form, and presents all of the chemical reactions of silicic acid obtained from the natural silicates. The silica obtained from ash by either of the processes indicated, on close examination, was observed to be entirely free from any combination, showing that it had been assimilated in the free state.

To demonstrate this theory, my friend G. I. Popplein, Esq., of this city, suggested the application of infusorial earth of the Richmond formation, found in large quantities on the western shore of the Chesapeake bay, to land sown in wheat. I have obtained straw from wheat so grown, and have found, after it has been treated with nitric acid and the siliceous remains placed on the field of the microscope, that it consisted wholly of the siliceous shields of Diatomaceæ, the same as found in the infusorial earth, excepting that the larger disks in their perfect form were absent (*Actinocyclus Ehrenbergii* and *Actinoptychus undulatus*). My conclusion is that they (and there probably may be other forms) are too large to enter the root-capillaries. During the coming summer I will attempt, if possible, to make micrometer measurements of both.

The discovery of Diatomaceæ in their original form in this wheat-straw precludes the possibility of the infusorial earth having undergone any chemical change in the soil, either by forming chemical combination with the alkalies or the earths, or by suffering physical disintegration from any catalytic action of any salts present in the soil.

In the particles of silica placed upon the glass slide, when they were completely separated from each other, the outlines of the individual diatoms were sharply and distinctly defined. On the other hand, when the physical action of ebullition with nitric acid was not sufficient for the complete separation of the particles of the epidermal shield, there was observed a marvellous interlacing of the various forms, showing that they were conveyed by the sap-cells directly to the section of the plant where they were destined to complete its structure. I have examined several specimens of straw, taken at random in the market: the silica in each specimen consisted of plates, very thin and truncated at the corners.

The result of these investigations shows the necessity of finely divided silica in the soil, so minute as to be capable of passing with facility through the sap-cells; secondly, that simple or compound silicates are useless as fertilizing agents, either natural or artificially prepared. We have no valid reason for forming any theory that vegetation can, through any known chemical law, separate the elements or their compounds from combinations so positive in their character.

In this case we have a practical result, capable of being verified at any stage of growth of a plant, produced by the application of silica to the soil in the form of certain well-defined microscopic organisms; for, finding these in the ash to the exclusion of other particles of silica, they seem to be more acceptable for the plant-structure. Free silica is hence the only condition in which it can enter the plant.

I look upon this discovery as leading agricultural investigations in a new direction; and it must eventually change many of the views expressed and accepted by scientists.

Every precaution was used in having all the material thoroughly cleansed, with a view both to accuracy and to removing suspicions that these microscopic forms were the result of dust-showers.—*Silliman's American Journal*, May 1876.

Washington University, Medical Department.
Baltimore, Md., February 1876.

On Fish of the Ceratodus-*group existing in the River Fitzroy, South Australia.* By M. Paul Gervais.

M. Paul Gervais announces that he has received from M. Francis de Castelnau, French Consul at Melbourne, an intimation of the existence in the river Fitzroy of a new form of fish allied to *Ceratodus*. It presents the principal characters of the species from the river Burnett, to which Messrs. Krefft and Günther have given the name of *Ceratodus Forsteri*, but differs from them sufficiently to lead M. de Castelnau to regard it as forming a distinct genus. He gives the name of *Neoceratodus* to this genus, and calls the species *N. Blanchardi*.—*Comptes Rendus*, May 1, 1876, p. 1034.